PTO/S8/08a (07-09) 7/34/2012 OMB 0861-0031

Approved for use through 07/31/2012 CAMS 9661 0031
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Officer, U.S. DEPARTMENT OF COMMERCE
U.S. Patent AND U.S. Patent OFFICER, U.S.

Substitute for form 1449/PTO

Sheet 1

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many shoets as nocessary)

of 112

pend to a collection of informat	ion unless à contains a valid OMB control numbe			
Complete if Known				
Application Number	10/591,730			
Filing Date	February 26, 2007			
First Named Inventor	Dong-Seok Suh			
Art Unit	1724			
Examiner Name	Arun S. Phasge			
Attorney Dockel Number	21724-003US1			

Examiner	Cita	Document Number	Publication Date	Name of Patentee or	Pages, Columns, Linns, Where
Initiats*	No. ²	Number-King Code ² if Impag	MM-DD-YYYY	Applicant of Cited Document	Relevant Passagus or Relevant Figures Appear
		^{US-} 4585652	04-29-1986	Miller et al	
		^{US-} 5079674	01-07-1992	Francis P. Malaspina	
		^{US-} 5429893 A	07-04-1995	George Thomas	
		^{US-} 5518836	05-21-1996	Francis P. McCullough	
		US- 5705259	01-06-1998	Mrotek et al.	
		^{US-} 6261469	07-17-2001	Zakhidov, et al.	
		^{US-} 6493210	12-10-2002	Nonaka, et al.	
		US- 2003/0211637	11-13-2003	Schoeniger et at.	
		^{US-} 6795293	09-21-2004	Timonov et al.	
***********		^{US-} 7061749	06-13-2006	Liu et al.	***************************************
***************************************		^{US-} 7167355	01-23-2007	Zheng Chen	
		^{US-} 7541715	06-02-2009	Chiang, et al.	
		^{∪s.} 7897030	03-01-2011	Suh, et al.	
	Ī	138-			
***************************************		US-			
		US-			
		US-			
		US-			***************************************
		US-			

,,,		***********		יייטייטייטייטוייטטטייטייטי			*********
l.		FOREIGN PATENT DOCUMENTS					
Г	Examiner	Cite	Foreign Patent Document	Publication	Name of Patentee or	Pages, Columns, Linea.	
1	irstials'	No.		Onte	Applicant of Cited Document	Where Relevant Pessages Or Relevant Figures Appear	
1				WAY DO ANN		Or Relevant Figures Appear	71
L			Country Code ³ Number ⁴ Kind Code ⁵ (# known)		[
Г			WO 2004/009884	01-29-2001	Clinates et al		
L			77	D: "ZO" & UU :	Francent, et av	<u> </u>	
1							1 1
۳						 	-
1							
۳			 				1
L		L					1
Г							
ļ.		ļ					
l							1 1

Examenar	Date	
Communa	Consid	cotrand
Signature	Const	tacted

"EXAMINES, Initial if relevenes consistence, whether or not obtains is in conformance with MPEP 609. Dave fine through clatter in the in conformance and cost considered, headed copy of the form with event commissions to applicate the "application" to use obtained designation mamber (spinosis) and Exercise College of USPTO Patient Documents as year-upsigo.org or MPEP 90.10.4. "Either Office that issued the document by the two letter code (MPEP Standard 97.3)." For Jagainese patient Countereds, the incidence of the year of the region of the Employee must precede the nearth number of the patient document with the patient document with the patient document with appropriate symbols as indicated on the document under WIPO Standard \$7.16 if possible. "Applicant is to place a check mark here if Employ, language Transitions is affected."

This collection of information is required by 3T CPR 197 and 198. The information is required to obtain or relatin a broadth by the public when is to fill (and by the UPPTO to proceed) an application. Conditionable is generated by 3S U.S.C. 122 and 3T CPR 1.14. This collection is estimated to both to complete industring gathering properly, and stainmining the completed applications from to the USPTO. Time will vary depending upon the industrial case. Any comments on the annual of their year complete this from marrier suppositions for indusing this bundle, should use sent to the Chief Information of the complete this from marrier suppositions for indusing this bundle, should use sent to the Chief Information of t

PTC/38/08b (07-09) Approved for use through 07/31/2012, OMB 9861 0031

Approved for size intrough 07/31/2012, CMR 9881 '0031 U.S. Patient and Trademark CRitice, U.S. OEPARTMENT OF COMMERCE U.S. Patient and Trademark CRitice, U.S. OEPARTMENT OF COMMERCE As a collection of information unloss 3 contains a world CMR control author.

Substitute for form 1449/PTO	Complete if Known		
And the state of t	Application Number	10/591,730	
INFORMATION DISCLOSURE	Filing Date	February 26, 2007	
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Sub	
	Art Unit	1724	
(Use as many sheets as necessary)	Examiner Name	Arun S. Phasge	
Sheet 2 of 12	Attorney Docket Number	21724-003US1	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
		AREPALLI, et al; "Carbon-Nanotube-Based Electro-chemical Double-Layer Capacitor Technologies for Spaceflight Applications"; JOM, December 2005; pp. 26-31	
		FRACKOWIAK, E., et al; "Carbon Materials for the Electrochemical Storage of Energy in Capacitors"; Carbon; July 2000; pp. 937-950	
		HUGHES, M., et al.; "Electrochemical Capacitance of a Nanoporous Composite of Carbon Nanotubes and Polypyrrole; Chemical Materials, Vol 14, February 2002; pp. 1610-1613	
		KHCMENKO, V., et al; "Dermination of the Specific Cepacitance of Conducting Polymer/Nanotubes Composite Electrodes using Different Cell Configurations; Electrochemica Ada, Vol. 50, December 2004; pp. 2489-2508	
		LEWIS, T.D.; "Interfaces are the Dominant Feature of Dielectrics at the Nanometric Level"; IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 11, No. 5; October 2004; pp. 739-753	•
		SUNG, et al.; "Fabrication of all-solid-state Electrochem-ical Microcapacitors"; Journal of Power Sources, Vol. 133; April 224; pp. 312-319	
***************************************			********

Examiner	r Date	ı
Signature	3 Considered	- 1
L		t

^{*}EXAMINER: while if reference considered, whether or not citation is in conformance with MPEP 609. Draw line modulo citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

^{*}Agabant* unique olidation independent embelle (optional): A Agabant in its plants of those trans there it English languages Translation is, statuted in the Commission of the

PTC/S8/08b (07-09) Approved for use through 07/31/2012, OMB 9881 0031

U.S. Patient and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Unided the Passerwork Reduction Act of 1995, his persons are required to respond to a collection of information unless it contains a visit OMB control number

Substitute for form 1449/PTO	Complete if Known		
	Application Number	10/591,730	
INFORMATION DISCLOSURE	Filing Date	February 26, 2007	
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Suh	
(Use as many sheets as necessary)	Art Unit	1724	
(Use as many sineers as necessary)	Examiner Name	Arun S. Phasge	
Sheet 3 of 12	Altomey Docket Number	21724-003US1	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*			T2
		ALBERTI, G. et al, "Solid State Protonic Conductors, Present Main Applications and Future Prospects": Solid State Ionics, Vol. 145, pp. 3-16; 12/01/2001; Elsevier Science; NL	
		ALBERTI, G. et al., "Polymeric Proton Conducting Membranes for Medium Temperature Fuel Cells (110-160°C)"; J of Membrane Sci; Vol. 185, pp. 73-81; 04/15/2001; Elsevier Science; NL	
		AN, K.H. Et al., "Electrochemical Properties of High-Power Supercapacitors Using Single-Walled Carbon Na-notabe Electrodes" Advanced Functional Materials; Vol 11, pp. 387 – 392; 05/1/2001; John Wiley & Sons, Inc.; US	
•••••		ANTONUCCI, P.L. et al "Investigation of a direct mediannal fuel cell based on a composites Nation®-silica cleritgrolyte for high temperature operations". Solid State Ionics Vol. 125, no month 1999, pp. 431-437; Elsevier Science B.V.: Amurcidam. The Nethorlands.	
		ASAMITSU, A; et al., "Current switching of resistive states in magnetroesistive manganites"; Nature Vol. 388, No. 6637; 07/03/1997, pp 50-52; Nature Publishing Group; Macmillan Publishers Lid.; US	
		BACHILO, S.M. et al: "Narrow (n.m.)-Distribution of Single-Walfed Carbon Nanotubes Grown Using a Solid Suported Canlays" JAJCJS Communications: Vol. 125, pp. 11486-11187, 08/21/2603; Journal of the American Chemical Society, US	
		HATTEY L.S. of a "Increased Astronics Rate of Elico-transcharicsi Carton Nazorate Autrates Strain Photonical Polices in the Revisiones Componenties" bound of Strain Macronic and Strainstone, Vol. 12, 6425/0003; pp. 549-555, feat-bits of Physics Andriadage, US	
		BAUGHMAN, R.H. "Muscles Made from Metals"; Science 300, 04/11/2003; pp 268-269; American Association for the Advancement of Science, Washington, DC; US	
•••••		BAUGHIMAN, R.B. et al., "Carbon Nanotubes - The Route Towards Applications"; Science 297, 08/02/2002; pp 787-792; American Association for the Advancement of Science, Washington, DC; US	
		BAUGHMAN, R.H. et al., "Carbon Nanotube Actuators", Science 284, 05/21/1999; pp 1340-1344; American Association for the Advancement of Science, Wash-ington, DC; US	

3	Examiner	Date	1
	Signature	Considered	
- 3	L	 	}

^{*}EXAMPLER: while if reference considered, whether or not sitation is in conformance with MPEP 808. Draw line modulo classor if you is conformance and not considered. Include copy of this form with next communication to applicant.

Egipland's unique distinct independent ember (optional). A Applicant in its stems of those must have 8 English languages Translation in structured.

This collection of independent ember by of CPR 1.36. The information is required to chase in ceitable a release a benefit by the poster when his is, here load by the USPTO to processy an application. Confidentially is generated by 30 U.B.C. 122 and 37 CPR 1.14. This voluntation is resistant of being 2 being 1.50 to complete graphics and applications of the consplicted application form to the USPTO. There will very depending upon the individual cases and applications of the process of the completed application form to the USPTO. There will very depending upon the individual cases (CSP Patents and Commission for the USP CSP Patents and Commission for the USP CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents and Commissioner for Patents, P.O. Box 1450, Maternation (CSP Patents, P.O

PTC/08/08/0 (07:09) Approved for use: through 07/31/2012, OMB 9881 0031

Approved to see, indication of the process of the Passarware Reduction Act of 1995, his persons are required to respond to a collection of information unless it contains a variet ORIS contain surface.

Substitute for form 1449/PTO		Complete if Known
Commissions to confer and conference of	Application Number	10/591,730
INFORMATION DISCLOSURE	Filing Date	February 26, 2007
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Suh
(Use as many sheets as necessary)	Art Unit	1724
tone no many america no recomment	Examiner Name	Arun S. Phasge
Sheet 4 of 12	Attorney Docket Number	21724-003US1

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), little of the article (when appropriate), title of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		BAUGHMAN, R.H., "Conducting Polymer Artificial Muscles"; Synthetic Metals 78, no month, 1996, pp 339-353; Elsevier Science B.V.; Amsterdam, The Netherlands	
		BOWER, C. et al., "Plasma-induced alignment of carbon nanotubes"; Applied Physics Letters, Vol. 77, No. 6; 08/07/2000; pp. 830-832; American Institute of Physics; US	
		BOZKURT, A. et al., "Proton-conducting polymer elec-trulytes based on phosphoric acid; Solid Sate lomics 125, no month, 1999; pp 225-233; Elsevier Science B.V.; Amsterdam, The Netherlands	
		BURGMAYER, et al., "Ion Gate Electrodes, Polypyrrole as a Switchable Ion Conductor Membrane"; Journal of Physical Chemistry, Vol. 88, 06/1984; pp. 2515-2521; American Chemical Society; US	
		CAMPBELL, J.K. et al., "Electrochemistry Using Single Carbon Nanotubes"; J. Am. Chem. Soc.; Vol. 121(15); 04/02/1999; pp 3779-3780; American Chemical Society	
		CASSELL, A.M. et al., "Combinatorial chips for optimizing the growth and integration of curbon nanofiber based devices"; Nanotechnology BLS, 11/10/2003; pp 9-15; Institute of Physics Publishing; 10P Publishing Lie; UK	
		CASSELL, A.M. et al., "Combinatorial Optimization of Heterogeneous Catalysts Used in the Growth of Carbon Nanotubes"; Langmuir 17; 11/18/2000; pp 260-264; American Chemical Society	
		CHE, G. et al., "Carbon Nanotube Membranes for Elec-trochemical Energy Storage and Production"; Nature 393; May 28, 2998; pp 346-349; Nature Publishing Group, Macmillan Publishers Ltd; US	
•••••		CHOL V.S. et al. "An under-gate triode structure field emission display with earbout nanotube emitter,"; Di-annord and Rebated Materials 10: pp 1705-1708: no tnomb, 2001, Elsevier Science B.V.; Amsterdam, The Netherlands	
		COLLINS, P. et al., "Engineering Curbon Nanombes and Nanotube Circuits Using Electrical Breakdown"; Scionee 292, pp 706-709, April 27, 2001; American Association for the Advancement of Science, Washington, DC; US	

1	Examiner	Date	l I
	Signature	Considered	

^{*}EXAMINER: white if reference considered, whether or not station is in conformance with MPEP 809. Draw line module classor if our in conformance and not convenienced. Include copy of this form with next communication to applicant.

^{1.} Against surges ordinor disperation number (optional). 2. Appliant is to state at check mark time it English ingrappy Torontation in structured.
The collection of horizontation is not provided in the collection of the protein of the collection of the

Approved for use through 07/31/2012, OMB 9881 0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Surveyed the few from \$44	settle for form 1448/PTO			Complete if Known		
was a series of the series of			Application Number	10/591,730		
INFORMAT	TON DIS	CLOSURI	Filing Date	February 26, 2007		
STATEMENT BY APPLICANT		First Named Inventor	Dong-Seok Suh			
21	anv sheets as n		Art Unit	1724		
(Unit as it	iany ameria aa n	recessary)	Examiner Name	Arun S. Phasge		
Sheet 5	of	12	Attorney Docket Number	21724-003US1		

·	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		DAI, Hongjie; "Carbon Nanotubes: Synthesis, Integra-tion, and Properties" Accounts Chemical Research 35, pp 1035-1044; August 7, 2002; American Chemical Society, US	
		DUAN, et al, "General Synthesis of Compound Semicon-ductor Nanowires"; Advanced Materials Vol. 12, No. 4; pp 298-302; no month, 2000WILEY-VCH Verlag Gmbb; DE	
		DUESBERG, G.S. et al., "Growth of Isolated Carbon Nanotugbes with Lithographically Defined Diameter and Location", Nano Lotters Vol. 3, No. 2; pp 257-259; Jan-uary 25, 2003; American Chemical Society, US	
		EKIMOV, E.A. et al., :Superconductivity in Diamond"; Nature, Vol 428., pp 542-545; April 1, 2004; Nature Pub-lishing Group; Macmillan Publishers Ltd.; US	
		ERLEBACKER, J. et al., "Evolution of nanoporosity in Dealloying"; Nature, Vol. 410, pp 450-453; March 22, 2001; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		FAN, S. et al., :Self-Ctriented Regular Arrays of Carbon Nanotubes and Their Field Braission Properties; Science, Vol. 283, pp \$12-514; January 22, 1999; American As-sociation for the Advancement of Science; US	
		FIEBIG, M., et al., "Visualization of the Local insulator-Metal Transition in Pro. 7Ca0.3Mn03"; Science, Vol. 280 pp 1925-1928; June 19, 1998; American Association for the Advancement of Science; US	
		GANGLOFF, L. et al., "Self-Aligned, Gated Arrays of Individual Nanotube and Nanowire Emitters", Nano Letters, Vol. 4, pp 1575-1579; July 29, 2004; American Chemical Society; US	
***************************************		GATES et al., "A Solution-Phase Approach to the Syn-thesis of Uniform Nanowires of Crystalline Selentum with Laterial Dimensions in the Range of 10-30 min"; J. Am. Chem. Soc. 122, pp. 12582-12583, December 1, 2000, American Chemical Society, US	
		GOFER, Y. et al., "An all-polymer charge storage device"; Applied Physics Letters 71, pp 1582-1584; September 15, 1997; American Institute of Physics; US	

# EXCHANGE !		LURKE .	
Signature		Considered	
2017 A 4460 E O 1 M II	tol if reference acceptance is deather a contribution in the section of the section of	<u> </u>	Anthony of a color of a color for announce count in an

consistered. Include reply of this form with next communication to applicant.

Observations industry depth or in North and reconstructions of the property of the Page 2018 of the Page 201 Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Approved for use through 07/34/2012 OMB 9881 0391
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1448/PTO	Complete if Known		
Commission to water and control of the	Application Number	10/591,730	
INFORMATION DISCLOSUR	Filing Date	February 26, 2007	
STATEMENT BY APPLICAN	T First Named Inventor	Dong-Seok Suh	
(Use as many sheets as necessary)	Art Unit	1724	
toon no many america as reconnecty	Examiner Name	Arun S. Phasge	
Sheet 6 of 12	Altomey Docket Number	21724-003US1	

Examiner	Cite	NON PATENT LITERATURE DOCUMENTS Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of	
exammer Initials*	No.	the item (book, magazine, journal senal symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	72
		GOLDBERGER, J. et al.; "Single-crystal gallium nitride nanotubes"; Nature Vol 422, pp 599-602; April 10, 2003; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		GU, G. et al., "V[sub]20[sub]5 nanofibre sheet actuators"; Nature Materials Vol. 2, pp 316-319; April 20, 2003; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		HADDON, R.C. et al., "Purification and Separation of Carbon Nanotubes"; MRS Bulletin Vol. 29, pp 252-259; April 2004; Material Research Society; US	
		HAFNER, J.H. et al., "Growth of nanotubes for probe microscopy tips"; Nature Vol. 398, pp 761-762; April 29, 1999; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		HAFNER, J.H. et al., "High-Yield Assembly of Individual Single-Walled Carbon Nanorube Tips for Scanning Probe Microcopies", Journal of Physical Chem. Vol. 105, No. 4, pp. 743-746; Pebrany 1, 2001, American Chemical Society, US	
		HSIOU. Y.F. et al., "Controlled placement and electrical contact properties of individual multi-waited enrion unrutubes on patterned silicon chips", Applied Physics Letters Vol. 84, No. 6; pp 984-996; American Institute of Physics, US	
		HUANG, M.H. et al., "Room-Temperature Ultraviolet Nanowire Nanolasers": Science 292, pp 1897-1899; June 8, 2001; American Association for the Advancement of Science; US	
		HUANG, S. et al., "Growth of Millimeter-Long and Ho-rizontally Aligned Single-Walled Carbon Nanotubes on Flut Substrates", J. Am. Chem. Soc. Vol. 125, pp 5636; April 22, 2003; American Chemical Society; US	
		JAVEY, A. Et al., "Carbon Nanotube Transistor Armys for Multistage Complimentary Logic and Ring Oscilla-turs": Nano Løtters, Vol. 2 No. 9; pp 929-992; July 31, 2002; American Chemical Society: US	
		JÖRISSAN, L. et al., "New membranes for direct metha-nol fuel cells"; J. Power Sources Vol. 105, pp. 267-273; Elsevier Science B.V.; NL	

Examine !		LURG.	1
Signature		Considered	
2012 C (400 20 O) NO	ial II reference and infantal a feather or set situation in the conference of the MOREO SET	<u> </u>	Automatica and the same for annual contract and

considered. Include reply of this form with next communication to applicant.

Observations included output on the first interest of the control Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Approved for use through 07/31/2012, OMB 9881 0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1448/PTO	Complete if Known		
Section 1997	Application Number	10/591,730	
INFORMATION DISCLOSURE	Filing Date	February 26, 2007	
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Suh	
(Use as many sheets as necessary)	Art Unit	1724	
(Use as many smeets as necessary)	Examiner Name	Arun S. Phasge	
Sheet 7 of 12	Altomey Docket Number	21724-003US1	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Cite Initials* No.		Include name of the author (in CAPITAL LETTERS), little of the article (when appropriate), ittle of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		KAMEOKA, J. et al. "A scanning tip electrospinning source for deposition of oriented nanobifires", Nanotech-nology 14, pp 1124-1129; September 5, 2003; Institute of Physics Publishing; UK	
		KIM, P. et al., "Thermal Transport Measurements of In-dividual Multiwalled Nanotubes"; Phys. Rev. Letters Vol. 87, Number 21; pp 215502-1 to 215502-4; November 19, 2001; The American Physical Society; US	
•••••		KIRYUKHIN, V., et. al., "An X-ray-induced insulator-metal transition in a magnetoresistive manganite"; Nature Vol. 386, pp. 813-815; April 24, 1997; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		RRÜGER, M, "Electrochemical carbon manotube field-effect transistor"; Applied Physics Letters Vol. 78, No. 9; pp 1291-1293; February 26, 2001; American Institute of Physics; US	
		KRUPKE, R. et al., "Sumulaneous Deposition of Metallic Bundles of Single-walled Carbon Nanotubes Using Addielectrohoreses"; Nano Lutters Vol. 3, No. 8 pp 1619-1023; July 9, 2003; American Chemical Society; US	
		LI, B. et al.; "Raman spectral study of silicon nanowires"; Physical Review B; Vol. 59, No. 3; pp 645-1648; January 15, 1999; the American Physical Society; US	
		L1, J. et al., "Novel Three-Dimensional Electrodes: Elec-trochemical Properties of Carbon Nanotube Ensembles" J. Phys. Chem. B. 106.; pp 9299-9305; August 16, 2002; Amorican Chemical Society; US	
		L1, W. et al. "Preparation and Characterization of Multi-walled Carbon Nanotube-Supported Platinum for Co-thode Camiyats of Direct Methanol Foel Cells"; J. Phys. Clem. B 107; pp. 6292-6299, June 6, 2003; American Chemical Society; US	
		LI, Y. et al.; "Bismuth Nanotubes: A Rational Low-Temperature Synthetic Route"; J. Am. Chem. Soc. 123; pp 9904-9905; September 14, 2001; American Chemical Society; US	
		LIN, C.L. et al., "Protoindaced hole-doping effect in (Y[sub]0.5Ca[sub]0.5[Ba[sub]2Cu[sub]3O[sub]* films"; Applied Physics Letters 71, pp 3284-3286; December 1, 1997; American Institute of Physics; US	

3	Examiner	Date	1
1	Signature	Considered	
- 3	L	 	4t

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Observations included output on an included and included control and applications of the control and applications of the control and applications of the control applicati

Approved for use through 07/31/2012, OMB 9881 0031 U.S. Patent and Trademark Office; U.S. OEPARTMENT OF COMMERCE

Substitute for frem 1448/PTO	Complete if Known		
	Application Number	10/591,730	
INFORMATION DISCLOSURE	Filing Date	February 26, 2007	
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Suh	
(Use as many sheets as necessary)	Art Unit	1724	
(use as many smeets as necessary)	Examiner Name	Arun S. Phasge	
Sheet 8 of 12	Attorney Docket Number	21724-003US1	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Cite Initials* No.		Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magezine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		BRABEC, C. et al, editors: "Organic Photovoltaics: Con-cepts and Realization"; Springer Series in Materials Science Vol. 60, no month, 2003; Springer-Verlag; DE	
		DELZEIT, L. et al., "Growth of multiwall carbon nano-tubes in an inductively coupled plasma reactor"; J. Appl. Letters, Volume 91, No. 9; May 1, 2001; pp 6027-6033; American Institute of Physics: US	
		DING, R.G. et al., "Nanofabrication of Organic/trougunic Hybrols of TrO(sub)2 with Substituted Philadocyanines or Polyhinghene"; (abstract only): Journal of Nanoscience and Nanotechnology 1; No. 2, pp 207-213; June 2001; American Scientific Publishers; US	
		RAN, JH., "Growth characteristics of earlsun nanotusies using platinum catalyst by plasma enhanced chemical super deposition": (abstract only); Diamond and Related Materials, Vol. 12, pp.878-883; July 2003; Elsevier Science B.V.; NL	
		KINARET, J.M., et al.; "A carbon-nanotube-based nano-relay"; Applied Physics Letters; Vol 82, No., 8; February 24, 2003; pp 1287-1289; American Institute of Physics, US	
		LIU, J. et al., "Recent Advances in Methods of Forming Carbon Nanotubes"; MRS Bulletin 29, pp 244-250; April. 2004; Material Research Society; US	
		LRU. J. et alt; "Fullierene Piper; Science Vol. 280, pp 1253-1256; May 22, 1998;; American Association for the Advancement of Science. Weshington, DC; US	
		L1U, S.Q. et. al., "Electric-pulse-induced reversible resis-tance change offect in magnetoresistive films"; Appl. Phys. Lett. Vol. 76, No. 19; pp 2749-2251; May 8, 2000; American Institute of Physics, US	
•		LOO, C.L. et al.; "Nanoschell-enables Photonics-Based Imaging and Therapy of Cancer"; Technology in Cancer Research & Treatment Vol 3, No. 1, pp 33-40; February 2004; Adenine Press; US	
		MANNHART, J. et al; "Large electric field effects in YBa[sub]2Cu[sub]3C[sub]7. ^a films containing weak links"; Applied Physics Letters 62, pp 630-633; February 8, 1993; Amer-ican Institute of Physics; US	

- 3	Examine 1		LARG.		
	Signature		Considered		
3	A CORONAL AND A STATE	Est if reference acceptance is fruit as a set state as in a conference and \$4000 80	O Phone (man Managara) a	Authors of a state of a conference and man	

considered. Include reply of this form with next communication to applicant.

Ordentiatives industrial origin or an involvent and recommendation of applications of the control of the contro Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Approved for use through 07/34/2012 OMB 9881 993 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 144	e e rese			Complete if Known	
was a series of the series of	B (MARALIC)		Application Number	10/591,730	***************************************
INFORMAT	ION DIS	CLOSUR	E Filing Date	February 26, 2007	
STATEMENT BY APPLICANT		T First Named Inventor	Dong-Seok Suh		
21			Art Unit	1724	***************************************
(Use as many sheets as necessary)		Examiner Name	Arun S. Phasge	***************************************	
Sheet 9	of	12	Altomey Docket Number	21724-003US1	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), little of the article (when appropriate), title of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		MAYER, B.T. et al.; "Sonochemical Synthesis of Trigon-al Selenium Nanowires"; Chemistry of Materials 15; pp 3852-3858; August 19, 2003; American Chemical Socie-ty; US	
		MICKELSON, et al., "Packing C60 in Boron Nitride Na-notubes"; Science 300, pp 467-469; April 18, 2003; American Association for the Advancement of Science, Washington, DC; US	
		MILLIS, A.J., "Lattice effects in magnetoresistive man-ganese perovskites"; Nature Vol. 392, pp. 147-151; March 12, 2998; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		MISEWICH, J.A. et al.; "Electrically induced Optical Emission from a Carbon Nanotube FET"; Science Vol. 300, pp 783-786; May 2, 2003; American Association for the Advancement of Science, Washington, DC; US	
		MIYANO, K., et al.: "Photoinduced Insulatur-to-Metal Transition in a Percyskite Manganite"; Phys. Rev. Let-ters, Vol. 78, No. 22; pp 4257-4260; June 2, 1997; Amer-ican Physical Society: US	
		MOHANAN, J.L., et al; "Porous Semiconductor Chalco-genide Aerogels"; Science Vol. 307, 397-399; January 21, 2005; American Association for the Advancement of Science, Washington, DC; US	
		MORIMOTO, Y. et al; "Pressure effects on charge-ordering transitions in Perovskite manganites": Physical Review B, Volume 55, No. 12; March 15, 1997; The American Physical Society; US	
		MORATTI: S.; "The Chemistry of Uses of polyphenyle-nevinylenes"; "; Handbook of Conducting Polymers; 2nd Ed., Chapter 13; pp 343-361; Marcel Dekker, New York, 1998	
		NIU, C. et al.; "High power electrochemical capacitors based on carbon nanotabe electrodes"; Appl. Phys. Let-ters, Vol. 70; pp1480-1482; March 17, 1997; American Institute of Physics; US	
		NORBY, T "Solid-state protonic conductors: principles, properties, progress and prospects"; Solid Sate Ionics 125, pp 1-11; no month, 1999; Elsevier Science B.V.; Amsterdam, The Netherlands	

# EXSUMINE	LUGRE .	ł I	
Signature	Considered		
*** Y & \$445,35 Q 16.			

consistened. Include copy of this form with next communication to applicant.

Lagillatin's unique violation designation member (optional). A population is in solenne a check must have 8 English languages Translation is, student of the processor of the pr amount of time you require to complete this form and/or suggestions for methoding this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Assessment, VA 22313-1450, DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

PTC/38/08b (07-09) Approved for use through 07/31/2012. ONB 9861 0031

Approved for see: Invoign 17/91/2012, Ower Sest 1902

U.S. Patent and Trademark Office; U.S. ObjeCARTMENT OF COMMERCE

Under the Pagework Reduction Act of 1995, he persons are required to respond to a collection of information strice; it contains a used OMB coping surpor

Substitute for form 1448/PTO		Complete if Known
	Application Number	10/591,730
INFORMATION DISCLOSURE	Filing Date	February 26, 2007
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Suh
(Use as many sheets as necessary)	Art Unit	1724
(Use as many smeets as necessary)	Examiner Name	Arun S. Phasge
Sheet 1() of 12	Attorney Docket Number	21724-003US1

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
		RAJESH, B. et al; "Pt-WQ3 supported on carbon nano-tubes as possible anodos for direct methanol fuel cells"; Fuel 81, pp 2177-2190; July 9, 2002; Elsevier Science B.V.: Amsterdam, The Neiberlands	
		RENEKER, D.H. et al.; "Nanometre diameter fibres of polymer, produced by electrospinning"; Nanotechnology 7, pp 216-223; no month, 1996; IOP Publishing; UK	
		RINZLER, A.G. et al.; "Large-scale purification of single-wall carbon nanotubes: process, product, and charae-terization"; Appl. Phys. A 67, pp 29-37; no month, 1998; Springer-Verlag; DE	
		SAKAI, J. et. al.; "Switching effect perpendicular to the plane of Pr0.5Ca0.5MnO3-y thin films"; J. Appl. Phys. Vol. 90, No. 3; pp 1410-1413; August 1, 2001; American In-stitute of Physics; US	
		SALIGER, et al.; "High surface area carbon aerogels for supercapacitors"; Journal of Non-Crystalline Solids 225, pp 81-85; no month 1998; Elsevier Science B.V.; Anis-terdam, The Neitherlands	
•••••		SCHINOMARA, H. et al.: "Electrically Stimulated Re-lease of Neurotransmitter from a Conducting Polymer Than Film on the Model of a Synapse". Chemistry Let-tens, pp 179-182, no month, 1985; The Chemical Society of Japan; JP	
		SCHLÜTER; A.; "Synthesis of Poly(para-phenylene)s"; Handbook of Conducting Polymers; 2nd Ed.; Chapter 8; pp 209-224; Marcel Dekker, New York, 1998	
		SHIRAKAWA, H; "Synthesis of Polyacetylene"; Hand-book of Conducting Polymers; 2nd Ed., Chapter 7; pp 198-207; Marcel Dekker, New York, 1998	
		SLOAN, J. et al.; "Crystaflisation inside fullerene related structures"; J. Materials Chemistry 7, pp 1089-1095; no month, 1997; Royal Society of Chemistry; London, GB	
		SOUNDARRAJAN, P. et al; "Surface modification of aligned carbon nanotube arrays for electrochemical sens-ing applications", in J. Vac. Sci. Technology A 21, pp 1198-1201, July/Aug 2003; American Vacuum Society, US	

# EXCHANGE !		LUGRE .		
Signature		Considered		
PENALORIO N	Est if a develope a securidad of a devide of a securidad in the conference of the MONO SEC	A 27 (burn 1	harry of a state of a factor was and man	

^{*}EXAMINER: while if reference considered, whether or not sitation is in conformance with MPEP 809. Draw line impough claims if not in conformance and not considered. Include copy of this form with next communication to applicant.

^{*}Agabant* unique violation designation remained confirmation. 2. Applicant in its stems of theories must have 8 English languages Translation in structured.

This confection of instrumental in present only of CPR 1.04. The information is required to channer or certain a betterful the proposed on the processor. Confidentially is generated by 10 CPR 1.04. This collection of received by 10 CPR 1.04. The information is required to channer or certain a terminal time of the proposed on the processor. Confidentially is generated by 10 CPR 1.04. This collection is resonanced to face 2 better to companies including galferting propriously, and abundhing the completed application forms for the UPPTO. This will know discount on the individual cases, comments on the proprious of the confidence of the confidence of the CPR 1.04. The confidence of the confidence of the CPR 1.04. The confidence of

PTC/SB/08b (07-09) Approved for use through 07/31/2012, OMB 9861 0031

Approved for sec through 97/31/2012, CMS 9881 9031

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. Patient and Trademark (Steer) U.S. DEPARTMENT OF COMMENCE

U.S. DEPARTMEN

Substitute for form 14	e cross			Complete if Known		
was and the			Application Number	10/591.730		
INFORMAT	TION DIS	SCLOSUR	E Filing Date	February 26, 2007		
STATEME	STATEMENT BY APPLICANT		T First Named Inventor	Dong-Seok Suh		
260000	oanv sheets as r		Art Unit	1724		
(Con as n	iany ameris as i	weessary)	Examiner Name	Arun S. Phasge		
Sheet	of	12	Altomey Docket Number	21724-003US1		

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), little of the article (when appropriate), ittle of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
		STROLL, M. et al., "Electrochemical and Raman measurements on single-walled carbon nanotubes"; Chemical Physics Letters 375; pp 625-631; no month, 2003; Elsevier Science B.V.; Amsterdam, The Netherlands	
		SUN, X, et al., "Composite electrodes made of Pt nano-particles deposited on carbon nanotubes grown on fuel cell backings". Chemical Physics Letters 379: pp 90-1645; no month, 2003; Fluevier Science B V; Amsandam, The Nichterlands	
		TOMIORA, Y. et al.; "Magnetic-field-induced metal-insulator phenomena in Pr1-xCaxMnG3 with controlled charge ordering instability"; Phys. Rev. B Vol. 53, No. 4; pp R1689-R1692; January 15, 2996; American Physical Society; US	
		TSIAKARIS, P.E., et al., "The oxidation of etharol over Pt catalyst-electrodes deposited on ZroJ subj2"; abstract only; Solid State lonies 152-153, 721-726 (2002) Elsevier Science B.V.; Amsterdam, The Netherlands	
		VELEV, O.D. et al.; "A class of porous metallic nano-structures"; Nature Vol. 401, p 548; October 7, 1999; Nature Publishing Group; Macmillan Publishers Ltd.; US	
		VRBANIĆ, D. et al; "Air-stable Monodispersed Mo6S316 nanowires"; Nanotechnology 15, pp 635-638; no month, 2004; Institute of Physics Publishing; US	
		WALTERS, D.A. et al, "Elastic strain of freely suspended single-wall carbon nanotube ropes"; Applied Physics Letters Vol. 74 No. 25; pp3803-3805; June 21, 1999; American Institute of Physics; US	
		WANG, C. et al.; "Proton Exchange Membrane Fuel Cells with Carbon Nanorube Based Electrodes": Nano Letters Vol. 4, No. 2; pp 345-348; December 30, 2993; American Chemical Society; US	
		WANG, J et al.: "Morphological Effectson the Electrical and Electrochemical Properties of Carbon Aerogels", Journal of the Electrochemical Society 148, pp 1975-1977; no month, 2001; The Electrochemical Society, Inc.; US	
		WEISSMULLER, J. et al. in Science 300, pp 312-315; April 11, 2003; American Association for the Advance-ment of Science, Washington, DC; US	

3	Examiner		Date	1
	Signature		Considered	
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<del></del>	<del>}</del>

^{*}EXAMPLER: relate if reference considered, whether or not citation is in conformance with MPEP 609. Eraw line timough chance if not in conformance and not considered. Include copy of this form with next communication to applicant.

^{*}Agabant* unique whitein dissipations entered continued. A Agabant in its plans a check must have it English language. Translation is utilizated.

This collection of instruments in protein part of your CPF 1.0 in primation is required to chase in creation a between the proposed with the protein part of your chain and protein part of your proteins of the protein part of your proteins of the protein part of your proteins of the proteins of your part of your

PTC/S8/080 (07-09) Approved for use: through 07/31/2012, OMB 0861-0031

Approved to see inscipring of a rest contains less than 1995, no persons are capained to respond to a collection of information enters it contains a viel ORB gaing pumper.

Linda the Paperviori Reduction Act of 1995, no persons are capained to respond to a collection of information enters it contains a viel ORB gaing pumper.

Substitute for form 1889/PYO		Complete if Known
Promisional Life (CASE ) Augustical CO.	Application Number	10/591,730
INFORMATION DISCLOSURE	Filing Date	February 26, 2007
STATEMENT BY APPLICANT	First Named Inventor	Dong-Seok Suh
(Use as many sheets as necessary)	Art Unit	1724
tone us many ameris as necessary	Examiner Name	Arun S. Phasge
Sheet 12 of 12	Attorney Docket Number	21724-003US1

	NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, senal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2	
		Wil, V. et al.: "Single Crystaffine Nanowiess of Lead Cats Be symbolized through Thermal Decomposition of Lead Accepte in Ethylene Glycal", Nano Letters Vol. 3, No. 8; pp 1163-1166; June 26, 2008; American Chemical Society; US		
		WU, Y. et al.; "Superconducting MgB2 Nanowires"; Ad-vanced Materials 13, No. 19; pp 1487-1489; October 2, 2001; Wiley-VCH, Verlag GmbH & Co. KgaA, Wein-heim, Germany		
•		XI, X. et al.; "Electric field effect in high Te supercon-ducting ultrathin YBa2Cu3O7-x films"; Applied Physics Letters 59 (26); pp 3470-3472; December 23, 1991; American Institute of Physics: US		
		XU, L, et al; "Synthesis and Magnetic Behavior of Peri-odic Nickel Sphere Arrays", Advanced Materials 15, pp. 1562-1564; September 2003; Wiley-VCH, Verlag GmbH & Co. KguA: DE		
		XU, L. et al.; "Metal Sphere Photonic Crystals by Nano-molding"; J. Am. Chem. Soc. 123, pp 763-764; January 9, 2001; American Chemical Society; US		
		VII. G. et al., "Polymer Photosolnic Cells, enhenced Efficiencies via a Network on Internal Dissor-Acceptor Henrolymetrion". Steme 270, pp 1789–1791; December 15, 1995; American Association for the Advancement of Sectence, Washington, DC. US		
		YU. JS. et al.; "Fabrication of Ordered Uniform Perous Carbon Networks and Their Application to a Catalyst Supporter"; J. Am. Chem. Society 124, pp 9382-9383; July 19, 2002; American Chemical Society; US		
		ZAKHIDOV, A. et al.; "Carbon Structiones with Three-Dimensional Periodicity at Optical Wavelengths": Science 282; pp 897-901: October 30, 1998, American Association for the Advancement of Science, Washing-fon, DC; US		
		ZHANG, S.S. et al.: "A Novel Electrolyte Solvent for Rechargeable Lithium and Lithium-Ion Basteries"; J. Electrochemical Society, Vol. 143, No. 12; pp 4047-4053; December 1996; The Electrochemical Society, Inc.; US		
		ZHANG, Y. et al., "Electric-field-directed growth of aligned single-walled earbon nanotubes"; Applied Physics Letters 79, 3155-3157; November 5, 2001; American Institute of Physics; US		

3	Examiner	Date	1
	Signature	Considered	
- 3	I	 	<del>}</del>

^{*}EXAMBLER, initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw time involge citation if you in conformance and not considered. Include copy of this form with next communication to applicant.

Explained's unique whitein designation exember (optional). 2 Applicant in its stems of thesis must have it Explain improve the property of the